

TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	i
CHAPTER 1. INTRODUCTION	1-1
The SWIM Act	1-1
The Evolution of the IRL SWIM Plan	1-1
Relationship to other Programs and Plans.....	1-5
Major Accomplishments and Challenges	1-12
References.....	1-13
CHAPTER 2. A LAGOON-WIDE OVERVIEW	2-1
Introduction	2-1
An Overview of the Programs – Seagrass and Water Quality, Coastal Wetlands, Public Awareness	2-2
Seagrass and Water Quality	2-3
Coastal Wetlands	2-26
Public Involvement and Education.....	2-34
References.....	2-36
CHAPTER 3. MOSQUITO LAGOON	3-1
Seagrass and Water Quality.....	3-1
Coastal Wetlands	3-12
References.....	3-15
CHAPTER 4. BANANA RIVER LAGOON	4-1
Seagrass and Water Quality	4-1
Coastal Wetlands	4-15
References.....	4-19
CHAPTER 5. NORTH & CENTRAL INDIAN RIVER LAGOON.....	5-1
Seagrass and Water Quality.....	5-1
Coastal Wetlands	5-40
References.....	5-47
CHAPTER 6. SOUTH INDIAN RIVER LAGOON.....	6-1
Seagrass and Water Quality.....	6-1
Coastal Wetlands	6-27
References.....	6-33

	Page
CHAPTER 7. ST. LUCIE ESTUARY AND WATERSHED.....	7-1
Introduction	7-1
Oysters, Submerged Aquatic Vegetation (SAV), and Water Quality	7-7
Land Acquisition and Habitat Restoration	7-41
Regional/USACE Projects	7-44
Public Involvement and Intergovernmental Coordination	7-46
Future Resource Conditions	7-47
References.....	7-50
CHAPTER 8: PROGRAM BUDGETS.....	8-1
Introduction	8-1
The Early Years (1988-1995)	8-1
The Recent Years (1996-2001)	8-2
The Next 5 Years (2002-2007)	8-3
APPENDIX A.	
TMDLs, Watershed Management Approach, the Clean Water Act,	
and the Florida Watershed Restoration Act.....	A-1
APPENDIX B	
Lists of Outstanding Florida Waters and Permitted Industrial	
Facilities within IRL Basin.....	B-2

LIST OF TABLES AND FIGURES

Tables

	Page
Table 2-1. Preliminary Identification of the Principal Water Quality Factors Affecting Light in the IRL System	2-13
Table 2-2. Prioritization of sub-basins in the IRL System	2-17
Table 2-3. Estimated Lagoon-wide Loads of Nitrogen, Phosphorus, & Suspended Solids from Domestic WWTPs	2-20
Table 2-4. Lagoon-wide Monitoring Activities to be Continued Over The Next 5 Years	2-22
Table 2-5. The 5-Year Plan List of Seagrass and Water Quality Strategies and Projects that have Lagoon-wide Application.	2-26
Table 2-6. The 5-Year Plan List of Coastal Wetland Strategies and Projects that have Lagoon-wide Application	2-34
Table 2-7. The 5-Year Plan List of Public Involvement and Education Projects.....	2-36
Table 3-1. General classification of Mosquito Lagoon segments – Good, Fair, or Poor	3-3
Table 3-2. Provisional “allowable” loading rates of TN, TP and TSS for Mosquito Lagoon based on estimated 1943 land cover loading rates	3-9
Table 3-3. The 5-Year Plan List of Seagrass and Water Quality Projects for the Mosquito Lagoon.....	3-11
Table 3-4. The 5-Year Plan List of Coastal Wetland Projects for the Mosquito Lagoon	3-15
Table 4-1. General classification of Banana River Lagoon segments – Good, Fair or Poor	4-3

	Page
Table 4-2. Non-point, surface water treatment projects in the Banana River Lagoon basin supported by SJRWMD/IRLNEP and local government cost-share funds, 1995-2001.....	4-8
Table 4-3. Provisional “allowable” loading rates for TN, TP, and TSS for Banana River Lagoon based on estimated 1943 land use loading rates.....	4-11
Table 4-4. The 5-Year Plan List of Seagrass and Water Quality Projects for the Banana River Lagoon.....	4-15
Table 4-5. The 5-Year Plan List of Coastal Wetland Projects for the Banana River Lagoon	4-18
Table 5-1. General classification of North and Central Indian River Lagoon segments – Good, Fair or Poor	5-1
Table 5-2. North IRL basin non-point, surface water treatment projects supported by SJRWMD/IRLNEP and local government funds, 1995-2001	5-15
Table 5-3. Central IRL basin non-point, drainage treatment projects supported by SJRWMD/IRLNEP and local government cost-share funds, 1995-2001	5-16
Table 5-4. Provisional “allowable” loading rates for TN, TP and TSS in North Indian River Lagoon based on estimated 1943 land use loading rates.....	5-32
Table 5-5. Provisional “allowable” loading rates for TN, TP and TSS in Central Indian River Lagoon based on estimated 1943 land use loading rates.....	5-32
Table 5-6. SJRWMD land acquisitions in North and Central IRL for buffer protection and water quality management purposes	5-34
Table 5-7. The 5-Year Plan List of Seagrass and Water Quality Projects for the North and Central IRL	5-40
Table 5-8. The 5-Year Plan List of Coastal Wetland Projects for the North and Central IRL	5-47
Table 6-1. General Classification of Southern IRL Segments.....	6-1
Table 6-2. South IRL Seagrass Distribution, 1986 – 1999, and Seagrass Target Acreages	6-3
Table 6-3. Water Quality Targets for the South IRL	6-8

	Page
Table 6-4. Description and Status of Seagrass and Water quality Projects.....	6-8
Table 6-5. Comparison of Water Quality Targets to Measured Values, 1990 - 1999.....	6-9
Table 6-6. St. Lucie Issues Team 2002 – 2003 Projects Rankings.....	6-11
Table 6-7. Description and Status of Pollutant Load Reduction Projects.....	6-13
Table 6-8. Description and Status of Monitoring, Modeling, and Applied Studies.....	6-14
Table 6-9. Projects for Establishing Optimum Freshwater Inflows to the South IRL.....	6-19
Table 6-10. Coordination with Other Agency Plans.....	6-22
Table 6-11. Draft Implementation Schedule for IRL-South Projects (SFWMD & USACE)	6-25
Table 6-12. Description and Status of Coastal Wetlands Projects.....	6-27
Table 7-1. SAV Habitat Requirements	7-13
Table 7-2. SLE Water Quality Monitoring Programs.....	7-15
Table 7-3. SLE: Median Water Quality Parameters (9-year data set).....	7-19
Table 7-4. Seagrass and Oyster (VEC) Water Quality and Bathymetry Projects.....	7-23
Table 7-5. Median nutrient values for all Florida estuaries and SLE.....	7-24
Table 7-6. Pollutant Load Reduction, Non-Point Source Stormwater Projects.....	7-25
Table 7-7. Pollutant Load Reduction, Non-Point Source Muck Projects	7-31
Table 7-8. Pollutant Load Reduction, Non-Point Source Septic Tank [or OSDS] Projects.....	7-32
Table 7-9. Monitoring, Modeling, and Applied Studies	7-34
Table 7-10. Land Acquisition and Habitat Restoration Projects.....	7-41
Table 7-11. Pollutant Load Reduction – Non-Point Source Joint SFWMD/USACE Projects	7-44

	Page
Table 8-1a. Lagoon-wide Budget: SJRWMD and SFWMD Budget Estimates	8-4
Table 8-1b. Mosquito Lagoon Budget: SJRWMD Contractual and Staff Estimates	8-5
Table 8-1c. Banana River Lagoon Budget: SJRWMD Contractual and Staff Estimates.....	8-6
Table 8-1d. North & Central IRL Budget: SJRWMD Contractual and Staff Estimates.....	8-7
Table 8-1e. South Indian River Lagoon Budget: SFWMD Budget Estimates	8-8
Table 8-1f. St. Lucie River Estuary Budget: SFWMD Budget Estimates	8-9
Table 8-2. Other Major Programs Benefiting the Indian River Lagoon System.....	8-10
Table A.1. TMDL Development and Implementation Schedule	A-2
Table B.1. List of Outstanding Waters in the Indian River Lagoon System	B-1
Table B.2.a List of Industrial Facilities, Stormwater Permit Holders, Active and Inactive.....	B-4
Table B.2.b. List of Industrial Facility Wastewater Discharge Permit Holders in the Indian River Lagoon Basin.....	

Figures

	Page
Figure 1-1. Goals and Objectives of the 2002 SWIM Plan for the Indian River Lagoon	1-4
Figure 1-2. Management issues shared in common between IRL SWIM and other governmental programs	1-5
Figure 2-1. Indian River Lagoon Basin sub-lagoon areas & major sub-basins.....	2-1
Figure 2-2. Seagrass coverages in the Indian River Lagoon system	2-4
Figure 2-3. Median percent surface light at the 1.7m target depth and seagrass depth index results for each IRL segment.....	2-6
Figure 2-4. Good, fair, and poor seagrass segments in the Indian River Lagoon Basin.....	2-7
Figure 2-5. Spatial distribution of color, salinity, TSS, and turbidity throughout the IRL system	2-9
Figure 2-6. Spatial distribution of total nitrogen, total phosphorus, and chlorophyll a throughout the IRL system	2-10
Figure 2-7. North-to-South spatial trend in total nitrogen & phosphorus concentrations in the IRL	2-12
Figure 2-8. Preliminary nutrient loading estimates: sediment diffusion vs. external Sources	2-19
Figure 2-9. General locations of major non-point source projects in the IRL Basin: muck removal and surface water management projects.....	2-23
Figure 2-10. Lagoon-wide impoundment reconnection status	2-28
Figure 2-11. Locations of land parcels identified for acquisition under the IRL Blueway Project.....	2-32
Figure 3-1. Mosquito Lagoon seagrass status by segment: 1999 seagrass coverage, acres of seagrass per map year, median percent surface light at the 1.7m target depth, and average seagrass depth index	3-2
Figure 3-2. Temporal distribution of color, salinity, TSS, turbidity, total phosphorus, total nitrogen, and chlorophyll a in the Mosquito Lagoon.....	3-4

	Page
Figure 3-3. Mosquito Lagoon TN, TP and TSS loading comparisons	3-6
Figure 3-4. Mosquito Lagoon Coastal Wetlands Status.....	3-13
Figure 4-1. Banana River Lagoon seagrass status by segment: 1999 seagrass coverage, acres of seagrass per map year, median percent surface light at the 1.7m target depth, and average seagrass depth index	4-2
Figure 4-2. Temporal distribution of color, salinity, TSS, turbidity, total phosphorus, total nitrogen, and chlorophyll a in the Banana River Lagoon.....	4-5
Figure 4-3. North to south distribution of salinity levels in the IRL system (means, S.D., 1990 - 1999)	4-6
Figure 4-4. Monthly Salinity Levels from 1987-2000 in the Banana River Lagoon.....	4-6
Figure 4-5. Banana River Lagoon TN, TP and TSS loading comparisons	4-7
Figure 4-6. Banana River Lagoon Coastal Wetlands Status.....	4-16
Figure 5-1. North Indian River Lagoon seagrass status by segment: 1999 seagrass coverage, acres of seagrass per map year, median percent surface light at the 1.7m target depth, and average seagrass depth index	5-2
Figure 5-2. Central Indian River Lagoon seagrass status by segment: 1999 seagrass coverage, acres of seagrass per map year, median percent surface light at the 1.7m target depth, and average seagrass depth index	5-4
Figure 5-3. Monthly salinity levels from 1990-1999 in the Cocoa-Melbourne area	5-5
Figure 5-4. 10-year mean salinities in the IRL system by segment and the relative abundance and diversity of seagrasses with an emphasis on the south Banana River Lagoon and Cocoa-Melbourne reach	5-6
Figure 5-5. Temporal distribution of color, salinity, TSS, turbidity, total phosphorus, total nitrogen, and chlorophyll a in the North IRL	5-8
Figure 5-6a. Temporal distribution of color, salinity, TSS, turbidity, total phosphorus, total nitrogen, and chlorophyll a in the Central IRL (segments IR9-11 through 13B)	5-9

	Page
Figure 5-6b. Temporal distribution of color, salinity, TSS, turbidity, total phosphorus, total nitrogen, and chlorophyll a in the Central IRL (segments IR14 through IR21)	5-10
Figure 5-7. North to south spatial trends in total nitrogen and phosphorus concentrations in the IRL	5-12
Figure 5-8. North IRL surface water TN, TP & TSS loading Comparisons.....	5-13
Figure 5-9. Central IRL surface water TN, TP and TSS loading Comparisons	5-14
Figure 5-10. Location of Priority Sub-basins and Water Control Districts (WCDs) in the Central Indian River Lagoon.....	5-17
Figure 5-11. Muck sediment distribution in the North and Central IRL System	5-28
Figure 5-12. North IRL Coastal Wetlands Status.....	5-41
Figure 5-13. Central IRL Coastal Wetlands Status	5-42
Figure 6-1. South Indian River Lagoon seagrass status by segment: 1999 seagrass coverage, acres of seagrass per map year, median percent surface light at the 1.7m target depth, and average seagrass depth index.....	6-2
Figure 6-2. Revised Water Quality Monitoring and Seagrass Transect Sites.....	6-4
Figure 6-3 Temporal distribution of color, salinity, TSS, turbidity, total phosphorus, total nitrogen, and chlorophyll a in the South IRL.....	6-6
Figure 6-4. Location of St. Lucie Issues Team projects, 1999-2001	6-10
Figure 6-5. Indian River Citrus League Voluntary BMP Partnership	6-12
Figure 6-6. St. Lucie R. Estuary and IRL Groundwater, Surface Water Interaction Study, Location of Monitoring Stations.....	6-15
Figure 6-7. Boundary Domain of the St. Lucie River Estuary Model.....	6-17
Figure 6-8. Grid Structure of the EFDC Water Quality Model	6-18
Figure 6-9. Coordination and Integration of Coastal Research and CERP	6-20
Figure 6-10. IRL South Plan Proposed Land Acquisition Components.....	6-23

	Page
Figure 6-11. South IRL Coastal Wetland Status	6-28
Figure 7-1. St. Lucie Estuary (SLE).....	7-1
Figure 7-2. SLE Watershed and Basins Map	7-3
Figure 7-3. Conceptual Diagram of Requirements for Freshwater Inflow Management.....	7-7
Figure 7-4. Effects of Various Freshwater Inflows on Salinity in St. Lucie Estuary	7-8
Figure 7-5. Historic Oyster Distribution.....	7-9
Figure 7-6. Range of Oyster Distribution as of 1997.....	7-10
Figure 7-7. Historic Submerged Aquatic Vegetation (SAV) Distribution.	7-12
Figure 7-8. Range of SAV Distribution as of 1997	7-12
Figure 7-9. SLE Water quality Monitoring Network.....	7-15
Figure 7-10. Urban Tributary Monitoring Network in SLE and South IRL.....	7-16
Figure 7-11. Dry and Wet Season Salinities in the SLE	7-21
Figure 7-12. Dry and Wet Season TP in the SLE	7-21
Figures 7-13 and 7-14. DO Bottom Percentages and Sample Counts.....	7-21
Figure 7-15. “Adopt a Drop” Organizational Relationships	7-30
Figure 7-16. SLE hydrodynamics model simulation of canal discharge impacts on salinity gradients	7-36
Figure 7-17. Atlantic Coastal Ridge Property and South Fork, St. Lucie R.	7-42
Figure 7-18. Allapattah Ranch Acquisition Project.....	7-43
Figure 7-19. Major Features of the Allapattah Ranch Acquisition and Wetland Restoration	7-43
Figure 7-20 Ten Mile Creek Water Preserve Area	7-45